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Meat and meat products — Determination of free fat content

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up has the right to be represented on that Committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

Prior to 1972, the results of the work of the Technical Committees were published as ISO Recommendations; these documents are now in the process of being transformed into International Standards. As part of this process, International Standard ISO 1444 replaces ISO Recommendation R 1444-1970 drawn up by Technical Committee ISO/TC 34, *Agricultural food products.*

The Member Bodies of the following countries approved the Recommendation :

Australia	India	Romania
Bulgaria	Iran	South Africa, Rep. of
Chile	Israel	Spain
Czechoslovakia	Korea, Rep. of	Thailand
Egypt, Arab Rep. of	Netherlands	Turkey
France	Norway	United Kingdom
Germany	Poland	
Hungary	Portugal	

The Member Body of the following country expressed disapproval of the Recommendation on technical grounds :

New Zealand

Printed in Switzerland

Meat and meat products — Determination of free fat content

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a reference method for the determination of the free fat content of meat and meat products by means of extraction.

With the procedure described, only the extractable amount of the fat of meat and meat products is determined.

2 REFERENCES

ISO 1442, *Meat and meat products — Determination of moisture content.*

ISO . . ., *Meat and meat products — Sampling.*[1)]

3 DEFINITION

free fat of meat and meat products : The fat extracted under the operating conditions described.

The free fat content is expressed as a percentage by mass.

4 PRINCIPLE

Extraction, by means of *n*-hexane or light petroleum, of the dried residue obtained in accordance with the method for determination of the moisture content specified in ISO 1442, removal of the solvent by evaporation, drying and weighing of the extract.

5 REAGENTS

5.1 Extraction solvent, *n*-hexane or, alternatively, light petroleum distilling between 40 and 60 °C, and having a bromine value less than 1. For either solvent, the residue on complete evaporation shall not exceed 0,002 g per 100 ml.

5.2 Boiling chips.

6 APPARATUS

Usual laboratory equipment not otherwise specified, and the following items :

6.1 Mechanical meat mincer, laboratory size, fitted with a plate with holes of diameter not exceeding 4 mm.

6.2 Extraction thimble, made of filter paper and defatted.

6.3 Cotton wool, defatted.

6.4 Extraction apparatus, continuous or semi-continuous, for example the Soxhlet type.

6.5 Sand bath or **water bath**, electrically heated, or similar suitable apparatus.

6.6 Drying oven, electrically heated, capable of being controlled at 103 ± 2 °C.

6.7 Desiccator, containing an efficient desiccant.

6.8 Analytical balance.

7 SAMPLE

7.1 Start from a representative sample of at least 200 g taken according to ISO ... .

7.2 Store the sample in such a way that deterioration and change in composition are prevented.

8 PROCEDURE

8.1 Preparation of sample

Render the sample uniform by passing it at least twice through the meat mincer (6.1) and mixing. Keep it in a completely filled, airtight, closed container and store in such a way that deterioration and change in composition are prevented. Analyse the sample as soon as possible, but in any case within 24 h.

1) In preparation.

8.2 Test portion

Dry a known mass, 5 to 10 g weighed to the nearest 0,001 g, of the prepared sample, by the procedure specified in ISO 1442. If desired, the dried test portion from the determination of moisture content may be used for the determination of free fat.

NOTE — It is also possible to take 3 to 5 g of the sample and dry it with a quantity of anhydrous sodium sulphate (about 30 to 40 g) such that the product can readily be removed from the vessel used for grinding.

8.3 Determination

Dry the flask of the extraction apparatus (6.4), containing some boiling chips (5.2), for 1 h at 103 ± 2 °C in the drying oven (6.6). Allow the flask to cool to room temperature in the desiccator (6.7) and weigh to the nearest 0,001 g. Transfer the dried test portion (see 8.2) quantitatively from the dish to the extraction thimble (6.2). Remove the last traces of the dried test portion from the dish, using cotton wool (6.3) moistened with the extraction solvent (5.1), and also transfer this cotton wool to the thimble. Place the thimble in the extraction tube of the apparatus. Pour the extraction solvent into the flask of the extraction apparatus; the amount of solvent shall be at least one and a half to two times the capacity of the extraction tube of the apparatus. Fit the flask to the extraction apparatus. Heat the flask for several hours on the sand bath, water bath or other apparatus (6.5), according to the extraction rate and the apparatus used.[1)]

After extraction, take the flask containing the liquid from the extraction apparatus and distil off the solvent, using, for example the sand bath or water bath. Evaporate the last traces of the solvent using air blowing if desired.

Dry the flask for 1 h in the drying oven regulated at 103 ± 2 °C and, after allowing it to cool to room temperature in the desiccator, weigh to the nearest 0,001 g. Repeat the operations of heating, cooling and weighing until the results of two successive weighings do not differ by more than 0,1 % of the mass of the test portion.

Verify the completion of the extraction by taking a second extraction flask and extracting for a further period of 1 h with a fresh portion of the solvent. The increase in mass shall not exceed 0,1 % of the test portion.

Carry out two determinations on the same prepared sample.

9 EXPRESSION OF RESULTS

9.1 Method of calculation and formula

The free fat content of the sample, expressed as a percentage by mass, is equal to

$$(m_2 - m_1) \times \frac{100}{m_0}$$

where

m_0 is the mass, in grams, of the test portion taken for drying;

m_1 is the mass, in grams, of the extraction flask with boiling chips;

m_2 is the mass, in grams, of the flask and boiling chips with the fat, after drying.

Take as the result the arithmetic mean of the two determinations, if the requirement of 9.2 is satisfied.

Report the result rounded to one decimal place.

9.2 Repeatability

The difference between the results of two determinations carried out simultaneously or in rapid succession by the same analyst shall be not greater than 0,5 g of free fat per 100 g of sample.

10 TEST REPORT

The test report shall show the method used and the result obtained. It shall also mention any operating conditions not specified in this International Standard, or regarded as optional, as well as any circumstances that may have influenced the result.

The report shall include all details required for complete identification of the sample.

1) This period shall be at least 6 h.